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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,277	05/16/2002	Raymond Anthony Keefe	Q68473	9288

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EXAMINER

BENSON, WALTER

ART UNIT PAPER NUMBER

2858

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/049,277		KEEFE, RAYMOND ANTHONY	
	<b>Examiner</b>		<b>Art Unit</b>	
	Walter Benson		2858	

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on amendment filed 11/21/03.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 9 is/are rejected.
- 7) ☐ Claim(s) 2-8 and 10 is/are objected to:
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Amendment A, received on 11/21/03, has been entered into record.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lathrop (US Patent No. 3,991,363 and Lathrop hereinafter) in view of Rider et al. (US Patent No. 5,361,029 and Rider hereinafter).

3. As to claims 1 and 9, Lathrop discloses a device for determining location of a fault in art underground cable [Abstract] causing an earth leakage path from an internal conductor to earth at the location of the fault substantially as claimed comprising:

where, when signal is applied to the conductor, earth leakage signal flows between the earth and conductor at the location of the fault (col. 2, lines 67-68 and col. 3, lines 1-2);

where the applied signal is a multi-frequency signal having at least two frequency components (col. 3, lines 58-66);

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the device having probe means positionable to receive the earth leakage signal (17, Fig. 3; col. 4, lines 23-25);

determining the direction from the device fault (col. 5, lines 61-64).

Lathrop did not expressly disclose:

means for rectifying a first component of the earth leakage signal corresponding to one said frequency component of said applied signal;

multiplying the rectified first component of the earth leakage signal with a second component of the earth leakage signal corresponding to another the frequency component of the applied signal;

from the result of the multiplication, determining the direction (i.e. distance) from the device to the fault.

Nonetheless, these features are well known in the art and would have been an obvious modification to the system disclosed by Lathrop, as evidenced by Rider.

In an analogous art, Rider discloses an apparatus and method for locating multiple concealed underground objects having:

means for rectifying a first component of the earth leakage signal corresponding to one the frequency component of the applied signal (col. 24, lines 52-56) for signal averaging;

multiplying the rectified first component of the earth leakage signal with a second component of the earth leakage signal corresponding to another the frequency component of the applied signal (col. 24 lines 62-65) to transform the signal;

from the result of the multiplication, determining the direction (i.e. distance) from the device to the fault (col. 24, lines 65-68).

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Given the teaching Rider, a person having ordinary skill in the art at the time the invention was made would have readily recognized the desirability and advantages of modifying Lathrop by employing the well known or conventional features of cable fault/locator technology, such as disclosed by Rider, in order to reduce the time to trace multiple lines with minimized signal interference and for the purposes discussed above.

***Allowable Subject Matter***

4. Claims 2-8 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record fails to teach or suggest individually or in combination an apparatus and method for determining location of a fault in an underground cable where the multiplication is effected as an array multiplication of sets of time-spaced samples of the first and second components of the earth leakage signal. Detecting and removing signal artifacts due to switching transients or other external interference. Determining a confidence indication, indicating a degree of reliability of the result.

***Response to Arguments***

5. Applicant's arguments with respect to claims 1 and 9 have been considered but are moot in view of the new ground(s) of rejection.

6. In the remarks the applicant argued in substance that:

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(1) the cited references do not disclose derivation of directional information.

7. Examiner respectfully traverses applicants remarks:

As to point (1), see paragraphs above, Lathrop in combination with Rider does disclose

“determining the direction from the device fault (col. 5, lines 61-64).”

#### **Prior Art Made of Record**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure

A. Lulham et al. (US Patent No. 5,714,885) discloses a method and apparatus for sensing a fault and its direction.

#### ***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter Benson whose telephone number is (703) 306-4525 Or (571) 272-2227 after 01/27/2004. The examiner can normally be reached on Mon to Fri 6:30 AM to 4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, N. Le can be reached on (703) 308-0750. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

Walter Benson *WB*  
Examiner  
February 4, 2004

  
**N. Le**  
**Supervisory Patent Examiner**  
**Technology Center 2800**